CLAIMS

What is claimed is:

1. An electronic ballast comprising:
an input rectifier circuit for rectifying an input voltage;
a voltage inverter circuit for receiving a rectified input voltage from said input rectifier circuit, and for providing voltage/current to a discharge lamp for providing a dimmable light;
a controller for controlling the operation of the voltage inverter circuit; and
a keep-alive feedback circuit for feeding back energy from said discharge lamp to said voltage inverter circuit to allow a high dimming operation.

2. The ballast of claim 1, wherein said keep-alive feedback circuit utilizes a capacitor for said feeding back energy.

3. The ballast of claim 1, wherein
said input rectifier comprises a plurality of diodes, and further wherein
said keep-alive feedback circuit comprises a capacitor connected to both said rectifier circuit and the discharge lamp for ensuring that at least one of said plurality of diodes is always conducting.

4. The ballast of claim 1 further comprising:
a constant voltage supply circuit connected to said rectifier circuit and for supplying a substantially constant voltage to said controller, wherein
said constant voltage supply circuit uses a voltage of the discharge lamp to provide said substantially constant voltage when the input current is low due to the high dimming operation.

5. The ballast of claim 1, wherein said input rectifier circuit includes:

a plurality of diodes operating at a frequency above the frequency of the input voltage, wherein at any given time at least one diode is in a conducting mode due to said keep-alive feedback circuit.

6. The ballast of claim 5, wherein said rectifier circuit further includes a capacitor for reducing a crest factor of the discharge lamp.

7. A dimmable discharge lighting apparatus comprising:

the electronic ballast of claim 1; and

said discharge lamp, wherein

said apparatus is for providing a dimmable light when connected to a dimming circuit for providing the input voltage.

8. An electronic ballast comprising:

an input rectifier circuit for rectifying an input voltage;

a voltage inverter circuit for receiving a rectified input voltage from said input rectifier circuit, and for providing voltage/currentto a discharge lamp for providing a dimmable light;

a controller for controlling the operation of the voltage inverter circuit; and

a constant voltage supply circuit for supplying a substantially constant voltage to said controller, wherein

said constant voltage supply circuit provides said substantially constant voltage both at low input currents and at high input currents.

9. The ballast of claim 8, wherein said constant voltage supply circuit uses a voltage of the discharge lamp to generate said substantially constant voltage during the low input currents, and further wherein said constant voltage supply circuit uses said voltage pulses of said inverter circuit

to generate said substantially constant voltage during the high input currents.

10. The ballast of claim 8, wherein said input voltage is from a dimming circuit, and wherein said constant voltage supply circuit includes:

a first capacitor connected to said inverter circuit for generating a first current based on the voltage of said inverter circuit during a low dimming operation of the dimming circuit; and

a second capacitor connected to the discharge lamp for generating a second current based on the voltage of said discharge lamp during a high dimming operation of the dimming circuit, wherein said constant voltage supply circuit sums said first current and said second current to generate said substantially constant voltage.

11. The ballast of claim 10, wherein said constant voltage supply circuit further includes a plurality of diodes for rectifying said first current and said second current.

12. The ballast of claim 8 further comprising a keep-alive feedback circuit for feeding back energy from said discharge lamp to said voltage inverter circuit to allow a high dimming operation of said apparatus.

13. A dimmable discharge lighting apparatus comprising:

the electronic ballast of claim 8; and

said discharge lamp, wherein

said apparatus is for providing said dimmable light when connected to a dimming circuit for providing the input voltage.

14. An electronic ballast comprising:

an input rectifier circuit for rectifying an input voltage from a dimming circuit;

a voltage inverter circuit having solid-state switches for receiving a rectified input voltage from said input rectifier circuit, and for

providing voltage/currents to a discharge lamp for providing a dimmable light;

a controller for controlling the operation of the voltage inverter circuit;

a keep-alive feedback circuit for feeding back energy from said discharge lamp to said voltage inverter circuit to allow a high dimming operation; and

a constant voltage supply circuit for supplying a substantially constant voltage to said controller, wherein said constant voltage supply circuit uses a voltage of the discharge lamp to generate said substantially constant voltage during a high dimming operation of the dimming circuit, and further wherein said constant voltage supply circuit uses said voltage/current of said inverter circuit to generate said substantially constant voltage during a low dimming operation of the dimming circuit.

15. The ballast of claim 14, wherein said input rectifier includes:

a plurality of rectifier diodes operating at a frequency above the frequency of the input voltage, wherein at any given time at least one diode is in a conducting mode due to said keep-alive feedback circuit; and

a capacitor for reducing a crest factor of the discharge lamp

16. The ballast of claim 15, wherein said constant voltage supply circuit includes:

a first capacitor connected to said inverter circuit for generating a first current based on a voltage of said inverter circuit; and

a second capacitor connected to the discharge lamp for generating a second current based on a voltage of said discharge lamp, wherein

said constant voltage supply circuit sums the first current and the second current to generate said substantially constant voltage.

17. The ballast of claim 16, wherein said keep-alive feedback circuit utilizes a capacitor for said feeding back energy.

18. A dimmable discharge lighting apparatus comprising:
the electronic ballast of claim 17; and
said discharge lamp, wherein
said apparatus is for providing a dimmable light when connected to the dimming circuit having a phase dimmer.

19. A dimmable discharge lighting apparatus comprising:
the electronic ballast of claim 14; and
said discharge lamp, wherein
said apparatus is for providing a dimmable light when connected to the dimming circuit having a phase dimmer.

20. The ballast of claim 14, wherein said constant voltage supply circuit includes:
a first capacitor for generating a first current based on a voltage of the discharge lamp; and
a second capacitor for generating a second current based on a voltage output by said inverter circuit, wherein
said constant voltage supply circuit sums the first current and the second current to generate said substantially constant voltage.